भारतीय मानक ब्यूरो
(केंद्रीय मुहर विभाग III)

हमारा संदर्भ : सी एम डी- III/16 : आई एस / आई ई सी 60947-5-1:2009 14 03 2018

विषय : आई एस / आई ई सी 60947-5-1:2009 के अनुपालन हेतु एस टी आई।

इसे उपरोक्त विषय का संदर्भ प्राप्त है ।
सक्षम प्राधिकारी ने उपरोक्त एस टी आई को अनुमोदित कर दिया है ।
सभी क्षेत्रीय और शाखा कार्यालयों से अनुरोध है की उपरोक्त एस टी आई का अनुपालन सुनिश्चित करें ।

औरोस्मिता कबिराज
वैज्ञानिक बी (सी एम डी-III)

प्रमुख (सी एम डी-III)
सभी क्षेत्रीय/शाखा कार्यालय
आई टी एस विभाग – बीआईएस इंट्रानेट पर डालने हेतू

BUREAU OF INDIAN STANDARDS
(Central Marks Department-III)

Our Ref: CMD-III/16 : IS/IEC 60947-5-1:2009 14 03 2018

Subject: STI for implementation of IS/IEC 60947-5-1:2009, "Low Voltage Switchgear And Controlgear PART 5 Control Circuit Devices And Switching Elements Sec 1 Electromechanical Control Circuit Devices"

This has reference to the subject mentioned above.
The Competent Authority has approved the STI for implementation of IS/IEC 60947-5-1:2009.
All ROs/BOs are requested to ensure the implementation of the above STI.

Aurosmita Kabiraj
Sc-B (CMD-III)

Head (CMD-III)

Circulated to: All ROs/BOs

Copy to: ITS – for hosting on Intranet please

SCHEME OF TESTING AND INSPECTION FOR CERTIFICATION OF LOW VOLTAGE SWITCHGEAR AND CONTROLGEAR PART 5 CONTROL CIRCUIT DEVICES AND SWITCHING ELEMENTS Sec 1 ELECTROMECHANICAL CONTROL CIRCUIT DEVICES

According to IS/IEC 60947-5-1:2009

1. LABORATORY

1.1 A laboratory shall be maintained which shall be suitably equipped and staffed, where different tests given in the Specification shall be carried out in accordance with the methods given in the Indian Standard.

1.2 All test equipments shall be periodically checked and calibrated and records of such checks/ calibration shall be maintained.

2. TEST RECORDS

2.1 All records of tests as per this Scheme of Testing and Inspection shall be kept in suitable forms approved by the Bureau.
2.2 Copies of any records and other connected papers that may be required by BIS shall be made available at any time on request.

3. QUALITY CONTROL

3.1 It is recommended that, as far as possible, Statistical Quality Control (SQC) methods may be used for controlling the quality of the product during production as envisaged in this Scheme [see IS 397 (various parts)].

3.2 In addition, effort should be made to gradually introduce a Quality Management System in accordance with IS/ISO 9001.

4. STANDARD MARK

4.1 The Standard Mark, as given in Column (1) of the First Schedule of the licence, shall be applied to each device provided always that the device to which the Standard Mark is so applied conforms to every requirement of the specification.

4.2 The Standard Mark may be incorporated in a name plate. The name plate shall be affixed in a manner and at a place such that there is no possibility of its being removed from the device and applied on some other sub-standard device.

5. MARKING

5.1 In addition, the provisions of clause 5 of IS/IEC 60947-5-1 shall also apply.

6. LEVELS OF CONTROL

6.1 The tests as indicated in Table 1, and at the levels of control specified therein, shall be carried out on the whole production of the factory covered by this scheme and appropriate records maintained in accordance with clause 2 above and charts may be maintained as per clause 3 above. All the production which conforms to the Indian Standard and covered by this licence shall be marked with Standard Mark.

7. CONTROL UNIT

7.1 For the purpose of this scheme, all devices of the same type and design manufactured in a week shall constitute a control unit. As and when the type or design of the product is changed, BIS shall be duly informed.

7.2 If devices of more than one type and design are manufactured in a week, they shall constitute a separate control unit.

7.3 On the basis of the test and inspection results, decision regarding conformity or otherwise of the devices to the requirements of the Specification shall be taken.

7.4 In respect of all other clauses of the Specification and at all stages of manufacture, the factory shall maintain appropriate control and checks to ensure that the product conforms to various requirements of the Specification.

8. RAW MATERIALS/COMPONENT

8.1 The raw material/component used shall conform to the relevant Indian Standard wherever they exist. Wherever the raw material/component used is under the Mandatory Certification of BIS, the raw material shall necessarily be ISI marked and no further testing is required. Wherever the raw material used is not under the Mandatory Certification of BIS, no further testing is required if accompanied with the Test Certificate or ISI marked.

9. REJECTIONS

9.1 A separate record shall be maintained giving information on quantity, serial no. of the product etc. relating to the rejection of the production not conforming to the requirements of the Specification and the method of disposal. Such material shall in no case be stored together with that conforming to the Specification and shall be destroyed beyond use.

10. SAMPLES

10.1 The licensee shall supply, free of charge, the samples required in accordance with the Bureau of Indian Standards (Certification) Regulations, 1988, as amended from time to time, from the factory or godown. BIS may draw samples from the open market, if available.

11. REPLACEMENT

11.1 Whenever a complaint is received soon after the goods with Standard Mark have been purchased and used, and if there is adequate evidence that the goods have not been misused, defective goods shall be replaced free of cost by the licensee in case the complaint is found to be genuine and the warranty period (where applicable) has not expired. The final authority to judge the conformity of the product to the Indian Standard shall be with BIS.

11.2 In the event of any damage caused by the goods bearing the Standard Mark, or any claim being filed by the consumers against BIS Standard Mark and not "conforming to" the relevant Indian Standard, entire liability arising out of such non-conforming product shall be of the licensee and BIS shall not in any way be responsible in such case.

12. STOP MARKING

12.1 The marking of the product shall be stopped under intimation to BIS if, at any time, there is some difficulty in maintaining the conformity of their product to the Specification, or the testing equipment goes out of order or due to any other reason. The marking may be resumed as soon as the defects are removed under intimation to BIS.

12.2 The marking of the product shall be stopped immediately if directed to do so by BIS for any reason. The marking may then be resumed only after permission by BIS. The information regarding resumption of marking shall also be sent to BIS.

13. PRODUCTION DATA

The licensee shall send to BIS a statement of quantity produced, marked and exported by him and the value thereof at the end of each operative year of the licence as per the enclosed proforma which has to be authenticated by a Chartered Accountant.

IS/IEC60947-5-1:2009
LOW VOLTAGE SWITCHGEAR AND CONTROLGEAR
PART 5 CONTROL CIRCUIT DEVICES AND SWITCHING ELEMENTS
Sec 1 ELECTROMECHANICAL CONTROL CIRCUIT DEVICES
TABLE 1 LEVELS OF CONTROL
(Para 5 of the Scheme of Testing and Inspection)

TEST DETAILS				LEVELS OF CONTROL		
Cl.	**Requirement**	**Test Methods**		**No. of samples**	**Frequency**	**Remarks**
		Clause	**Reference**			
General/Routine Requirements:						
5.2	Marking	5.2, 5.4	IS/IEC 60947-5-1	Every equipment	---	---
7.	Constructional requirements	7.1 & 8.2	-do-	Two	Once in a week for each type and design	As per the details declared by manufacturer
8.1.3	Mechanical inspection, verification of mechanical operation, Dielectric test	8.3.3.4	-do-	Every equipment	---	---
7.2 – Performance Requirements						
Test Sequence I						
7.2.1.2	Operating Limits of contactor relays	8.3.3.2	IS/IEC 60947-5-1	One	Once in a week for each type & design	(**)
7.2.3	Temperature Rise	8.3.3.3	-do-			
	Dielectric Properties	8.3.3.4	-do-			
	Mechanical properties of Terminal	8.2.4	IS/IEC 60947-1			
Test Sequence II						

IS/IEC60947-5-1:2009
LOW VOLTAGE SWITCHGEAR AND CONTROLGEAR
PART 5 CONTROL CIRCUIT DEVICES AND SWITCHING ELEMENTS
Sec 1 ELECTROMECHANICAL CONTROL CIRCUIT DEVICES
TABLE 1 LEVELS OF CONTROL
(Para 5 of the Scheme of Testing and Inspection)

7.2.4.1 a	Making and breaking capacities of switching elements under normal conditions Dielectric verification	8.3.3.5.2 IS/IEC 60947-5-1 8.3.3.5.5 b -do-	One	Once in six months for each type & design.	(**)
Test Sequence III					
7.2.4.1 b	Making and breaking capacities of switching elements under abnormal conditions Dielectric verification	8.3.3.5.3 IS/IEC 60947-5-1 8.3.3.5.5 b -do-	One	Once in six months for each type & design.	(**)
Test Sequence IV					
7.2.5	Performance under conditional short circuit current Dielectric verification	8.3.4 IS/IEC 60947-5-1 8.3.3.5.5 b -do-	One	Once in five years for each type & design.	(**)
Test Sequence V					
	Degree of protection of enclosed control circuit devices Verification of actuation force or moment	Annex C IS/IEC 60947-1 8.2.5 IS/IEC 60947-5-1	One -do-	Once in six months for each type & design.	(**)
Test Sequence VI					

IS/IEC60947-5-1:2009
LOW VOLTAGE SWITCHGEAR AND CONTROLGEAR
PART 5 CONTROL CIRCUIT DEVICES AND SWITCHING ELEMENTS
Sec 1 ELECTROMECHANICAL CONTROL CIRCUIT DEVICES
TABLE 1 LEVELS OF CONTROL
(Para 5 of the Scheme of Testing and Inspection)

7.1.3	Measurement of clearances and creepage distances	7.1.3 IS/IEC 60947-5-1	One	Once in a week for each type & design	(**)
8.2.6	Verification of limitation of rotation of a rotary switch	8.2.6 -do-			
7.3 Electromagnetic compatibility (EMC) tests, where applicable:					
7.3.1	General	7.3.1 IS/IEC 60947-5-1	One	Once in two years for each type & design.	(**)
7.3.2	Immunity	7.3.2 -do-			
7.3.3	Emission	7.3.3 -do-			
Special Test					
7.2.4.3 a	Mechanical Durability	C.2 Annex C IS/IEC 60947-5-1	One	Once in a year each for mechanical and electrical test of each type and rating	(**)
7.2.4.3 b	Electrical Durability	C.3 -do-			

IS/IEC60947-5-1:2009
LOW VOLTAGE SWITCHGEAR AND CONTROLGEAR
PART 5 CONTROL CIRCUIT DEVICES AND SWITCHING ELEMENTS
Sec 1 ELECTROMECHANICAL CONTROL CIRCUIT DEVICES
TABLE 1 LEVELS OF CONTROL
(Para 5 of the Scheme of Testing and Inspection)

Special Requirements:
Test for Class II Control Circuit Devices Insulated by encapsulation (Annex F)
(In addition to the relevant requirements of the standard, where applicable)

8.3.3.4	Dielectric test	8.3.3.4 IS/IEC 60947-5-1	Each control devices	--	(**)
8.3.3.4	Dielectric test (In new conditions)	F 8.1.2.1 -do-	One	Once a week for each type & design.	
F 8.1.2.2	Cable tests (if applicable) a) Pull test b) Torque test c) Push test d) Bend test	F.8.1.2.2 -do- G.8.1.1 G.8.1.2 G.8.1.3 G.8.1.4	One	Once in a week for each type & design.	
8.1.2.3	Rapid change of temperature test	Test Na IEC 60068-2-14	One	Once in a year for each type & design.	(**)
F 8.1.2.4	Impact test	F 8.1.2.4 IS/IEC 60947-5-1	One	Once in six months for each type & design.	
F 8.1.2.5	Damp heat, cyclic	Test Db IEC 60068-2-30	One	Once in a year for each type & design.	
F 8.1.2.6	Dielectric test after stresses	F 8.1.2.6 IS/IEC 60947-5-1	One	-do-	
8.3	Temp-rise tests	8.3.3.3 IS/IEC 60947-5-1	One	Once in a week for each type & design.	
8.3.4	Short Circuit test	8.3.4 -do-	One	Once in five years for each type & design	

Additional requirements for semiconductor switching elements for control circuit devices (Annex H)
(Sub Clause 8.1.2 applies with the following addition)

IS/IEC60947-5-1:2009
LOW VOLTAGE SWITCHGEAR AND CONTROLGEAR
PART 5 CONTROL CIRCUIT DEVICES AND SWITCHING ELEMENTS
Sec 1 ELECTROMECHANICAL CONTROL CIRCUIT DEVICES
TABLE 1 LEVELS OF CONTROL
(Para 5 of the Scheme of Testing and Inspection)

H 8.1	Voltage drop test	H.8.2 IS/IEC 60947-5-1	One	Once in a week for each type & design.	(**)
H 8.1	OFF-state current	H.8.4 -do-	-do-	-do-	
H 8.1	Making and breaking capacities	H.8.5 -do-	-do-	Once in six months for each type & design.	
H 8.1	Performance under short-circuit current conditions	H.8.6 -do-	-do-	Once in five years for each type & design	
H 8.1	Verification of electromagnetic compatibility	H.8.7 IS/IEC 60947-5-1	One	Once in six months for each type & design.	
H 8.1	Impulse voltage withstand test	8.3.3.4 -do-	-do-	Once in a year for each type & design.	

Special requirements for indicator lights and indicating towers (Annex J)
(In addition to the relevant requirements of the standard, where applicable)

J.7	Constructional requirements	7 IS/IEC 60947-5-1	Each indicator light	--	(**)
J.7.1.12	-do-	J.7.1.12 IS/IEC 60947-5-1	Two	Once in a week for each type & design.	
J.8.3.3.4	Dielectric test	J.8.3.3.4 IS/IEC 60947-5-1	Each indicator light	--	
J.8.3.3.4.3	Dielectric test (indicator lights with built-in transformers)	J.8.3.3.4.3 -do-	One	Once in a week for each type & design.	
J.8.3.3.3	Temp-rise tests	J.8.3.3.3 -do-	One	Once in a week for each type & design.	

IS/IEC60947-5-1:2009
LOW VOLTAGE SWITCHGEAR AND CONTROLGEAR
PART 5 CONTROL CIRCUIT DEVICES AND SWITCHING ELEMENTS
Sec 1 ELECTROMECHANICAL CONTROL CIRCUIT DEVICES
TABLE 1 LEVELS OF CONTROL
(Para 5 of the Scheme of Testing and Inspection)

J.8.3.4	Short Circuit test (on built-in transformers, if any)	J.8.3.4 -do-	One	Once in five years for each type & design	
J.8.4	Shock Vibration Indirect support Mounting	J.8.4.1.2 -do- J.8.4.1.3 -do- J.8.4.2 -do-	One One One	Once in a year for each type & design.	
J.8.5	Degree of protection for indicating towers	J.8.5 -do-	One	Once in a year for each type & design.	

Special requirements for control switches with direct opening action (Annex K)
(In addition to the relevant requirements of the standard, where applicable)

7	Constructional requirements	**7** IS/IEC 60947-5-1	For each control device		(**)
8	Test Sequence I to VI	IS/IEC 60947-5-1	No. of samples and frequency same as for control devices mentioned earlier in this STI.		
K 8.3.1	Test Sequence VII a) Mechanical operation at limits of temperature b) Verification of direct opening action	K 8.3.5 IS/IEC 60947-5-1 K 8.3.6 -do-	One	Once in six months for each type & design.	
K 8.3.1	Test Sequence VIII Verification of robustness of actuating system	K 8.3.7 -do-	-do-	-do-	
K 8.3.4	Performance under conditional short-circuit current	K 8.3.4 -do-	-do-	Once in five years for each	

IS/IEC60947-5-1:2009
LOW VOLTAGE SWITCHGEAR AND CONTROLGEAR
PART 5 CONTROL CIRCUIT DEVICES AND SWITCHING ELEMENTS
Sec 1 ELECTROMECHANICAL CONTROL CIRCUIT DEVICES
TABLE 1 LEVELS OF CONTROL
(Para 5 of the Scheme of Testing and Inspection)

				type & design	

Special requirements for mechanically linked contact elements (Annex L)
(In addition to the relevant requirements of the standard, where applicable)

L 8.4	Test of NC contact	L 8.4 (a) IS/IEC 60947-5-1 (Annex L)	5	Once in a week for each type & design	
L 8.4	Test of NO contact	L 8.4 (b) -do-	5	-do-	

(**) If the sample fails in one or more requirements, the marking of that particular rating shall be immediately stopped. After taking necessary corrective actions, two more samples of the rating shall be tested for all the tests of that sequence. Marking shall be resumed on passing of both the samples.

PROFORMA FOR OBTAINING PRODUCTION DETAILS

Period covered	
Name of Licensee CM/L No.	
Name of Articles (s)	IS No.
Grade/Type/Size/Variety/Class/Rating	
Brand/Trade/Name(s) of Product covered under BIS Certification Mark	
Total production of the articles(s) licensed for certification marking	
Total production of the article(s) conforming to Indian Standard	
Production covered with BIS Certification Mark and its Value : a) Quantity b) Value (Rs.)	
Brand Name used on production covered under BIS Certification Mark	
Calculation of marking fee on unit-rate basis; Marking Fee per unit a) Unit b) Quantity covered with BIS Certification Mark c) Marking fee rounded off in whole rupees as obtained by applying unit rates given in (a) on quantity given in (b) **NOTE:** In case a clause is not applicable, suitable remarks may be given against it	
Quantity not covered with BIS Certification Mark, if any.	
Reasons for such non-coverage	
Brand Name under which non-ISI goods were sold	
Quantity exported with BIS Standard Mark and its value	
Brand Name under which BIS Certified goods are exported	
Authentication by Chartered Accountant	